

**United States Patent Application****20040153232****Kind Code****A1****Wada, Masumi ; et al.****August 5, 2004**

High acceleration time shift control apparatus and control method for vehicle

### Abstract

A high acceleration time shift control apparatus and method for a vehicle is provided. The high acceleration time shift control apparatus includes a transmission which achieves plural shift speeds whose gear ratios are different from each other; and a high acceleration time upshifting control device which changes a shift speed of the transmission to a higher speed based on a predetermined determination rotational speed such that an input rotational speed of the transmission substantially reaches a target maximum rotational speed when a request for high acceleration is made by a driver. The high acceleration time upshifting control device outputs an upshift command for performing an upshift when the determination rotational speed reaches a predetermined shift determination speed; calculates an actual ineffective time until shifting is actually started and the input rotational speed starts decreasing after the upshift command is output; computes a virtual maximum rotational speed, that is a maximum rotational speed when the input rotational speed changes at a reference rotational speed change rate, based on the input rotational speed when the upshift command is output, the ineffective time and the predetermined reference rotational speed change rate; and changes the shift determination speed such that the virtual maximum rotational speed comes close to the target maximum rotational speed and then performs learning.

Inventors: **Wada, Masumi; (Toyota-shi, JP) ; Harada, Yoshiharu; (Toyota-shi, JP) ; Mizobuchi, Masayasu; (Aichi-gun, JP) ; Sakamoto, Naoki; (Toyota-shi, JP)**

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U.S. Class at Publication: **701/055; 701/051**  
Intern'l Class: **G06F 019/00**

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***Foreign Application Data***

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<b>Date</b>	<b>Code</b>	<b>Application Number</b>
Jan 17, 2003	JP	2003-009521

*5393* **United States Patent**  
**Bota , et al.**

**5,393,279**  
**February 28, 1995**

Control system for automatic transmission using torque converter speed ratio to determine the on-time for a solenoid controlled 3-2 timing valve

### **Abstract**

An automatic transmission shift control system includes a hydraulically controlled valve mechanism for connecting and disconnecting a supply of hydraulic pressure to frictional coupling elements. Connection and disconnection of the hydraulic pressure supply locks and unlocks the frictional coupling elements in order to automatically shift an automatic transmission into desired gears. A time regulator regulates a duration time for which the valve mechanism is kept actuated and with which a speed at which the frictional coupling element is locked changes. The time regulator is controlled so as to variably regulate the duration time according to conversion efficiency of a torque converter. This conversion efficiency is, for example, determined from a speed conversion ratio and a torque conversion ratio.

Inventors: **Bota; Keiji** (Hiroshima, JP), **Yoshimura; Hiroshi** (Hiroshima, JP), **Kurisu; Kenji** (Hiroshima, JP)

Assignee: **Mazda Motor Corporation** (Hiroshima, JP)

Appl. No.: **07/931,470**

Filed: **August 20, 1992**

### **Foreign Application Priority Data**

Aug 20, 1991 [JP]	3-208237
Oct 30, 1991 [JP]	3-285193
Oct 30, 1991 [JP]	3-285196

**Current U.S. Class:** **477/143 ; 477/147**

**Field of Search:** **74/866,889 364/424.1 477/143,147,149,153**

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Set	Items	Description
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796309 TRANSMISSION?

381109 VEHICLE

164583 AUTOMOBILE

149178 CAR

2301169 TIME

161387 DURATION

787529 PERIOD?

318859 SHIFT?

3244181 CONTROL?

4 PERIOD? (3W) SHIFT? (3W) CONTROL?

297721 LEARN?

407951 ARTIFICIAL?

25689 AI

249722 NEURAL?

1582213 PD<=030117

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218376 ROTATION?

710269 SPEED?  
16087 ROTATION? (3N) SPEED?  
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**3/3,KWIC/1 (Item 1 from file: 95)**

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**Fatigue relevant loads for manual transmission - New concep  
implementation**

(Materialermuedungsrelevante Belastungen fuer Schaltgetriebe  
Konzept und Implementierung)

Weiss, W; Vollbrecht, M; Bruder, T

International Conference on Gears, Vol.2, VDI-Ges. Entwicklu  
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2002

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**Fatigue relevant loads for manual transmission - New conc  
implementation**

2002

**ABSTRACT:**

...yields to longer testing times, whereas a shorter period  
reduce the development time . The methodology described in  
tackles these aspects to ensure a fast, customer correlated  
testing without loosing the fatigue relevant impact. The fat  
loading of a gear tooth of a rotating gear wheel depends on  
torque and the rotational speed . At current, rig tests w  
less fine structured block loading programs are commonly...

...cycles from torque reversals are typically not modelled.  
powertrain simulation - instead of replaying artificial si  
a real driving test is recommended. In general, powertrain s  
and even more full vehicle tests should be avoided due to  
constraints. The concept described in this paper combines th  
these two approaches. It requires a unique method of retriev  
matrices from torque- and rotational speed - time signal  
called 'rotational rainflow counting', models the revolution  
wheel under a torque- time history and thus covers the requ  
relevant aspects. The methodology developed now offers all p



for load data monitoring, rainflow based analysis methods as reconstruction of time series for rig testing. It includes taking care of the signal dependencies. Therefore, a...

DESCRIPTORS: FATIGUE OF MATERIAL; DURABILITY; ENDURANCE TEST LIFE; LIGHTWEIGHT DESIGN; FORCE TRANSFER; TOOTHED WHEELS; TO SPEED; TIME SERIES ANALYSIS

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